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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XB041

Small Takes of Marine Mammals Incidental to Specified Activities; Pile Driving in Port

Townsend Bay, WA

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of incidental harassment authorization.

SUMMARY: Pursuant to the Marine Mammal Protection Act (MMPA) as amended, NMFS provides notice that we have issued an Incidental Harassment Authorization (IHA) to the Washington State Department of Transportation Ferries Division (WDF) to incidentally harass, by Level B harassment only, 11 species of marine mammals during the transfer span replacement project at the Port Townsend ferry terminal in Port Townsend Bay, Washington.

DATES: This authorization is effective from November 12, 2012, through February 15, 2013.

ADDRESSES: An electronic copy of the IHA and related documents are available by writing to Michael Payne, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910-3225.

An electronic copy of the application containing a list of the references used in this document may be obtained by visiting the internet at:

<http://www.nmfs.noaa.gov/pr/permits/incidental.htm>. For members of the public who are unable to view these documents on the internet, a copy may be obtained by writing to the address specified above or telephoning the contact listed below (see FOR FURTHER INFORMATION

CONTACT). Documents cited in this notice may also be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Brian D. Hopper, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 et seq.) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specific geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Section 101(a)(5)(D) further established a 45-day time limit for

NMFS' review of an application, followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny the authorization.

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Summary of Request

In August 2011, NMFS received an application from WSF, requesting an IHA for the take, by Level B harassment, of small numbers of harbor porpoises (Phocoena phocoena), Dall's porpoises (Phocoenoides dalli), Pacific white-sided dolphins (Lagenorhynchus obliquidens), killer whales (Orcinus orca), gray whales (Eschrichtius robustus), humpback whales (Megaptera novaeangliae), minke whales (Balaenoptera acutorostrata), Pacific harbor seals (Phoca vitulina richardii), California sea lions (Zalophus californianus), northern elephant seals (Mirounga angustirostris) and Steller sea lions (Eumatopius jubatus) incidental to pile driving activities conducted during the replacement of a transfer span at the Port Townsend ferry terminal, which is located inside Port Townsend Bay in northern Puget Sound (see Figure 1-9 in the WSF IHA application). Upon receipt of additional information and a revised application (submitted October 2011), NMFS determined the application complete and adequate on January 5, 2012.

The applicant's project will replace the current cable-lift transfer span at Slip 1 of the Port Townsend ferry terminal with a hydraulic lift H span (see Figure 1-3 in the WSF IHA

application). The project will include removal of the existing transfer span, lift towers, tower foundations, and a portion of the bridge seat and replace them with a new transfer span, bridge seat, and lift cylinder shafts. During the project, up to 56 piles will be removed (40 timber and 16 steel), and require installation of up to 26 piles (16 steel, 8 temporary H-piles, and 2 cylinder shaft casings). Because elevated sound levels from pile driving have the potential to result in marine mammal harassment, NMFS issued an IHA for take incidental to the specified activity.

Description of the Specified Activity

The project will replace an aging cable-lift transfer span with a new hydraulic lift span at the Port Townsend ferry terminal in northern Puget Sound, Washington. Transfer spans are moveable traffic bridges that connect ferries with the terminal dock, allowing the transfer span to be raised or lowered depending on the daily tide levels (see Figure 1-2 in WSF's IHA application). The new hydraulic lifts, or H-spans, will be operated vertically by two hydraulic cylinders located under the offshore ends of the transfer span. The proposed project will involve the removal of the existing transfer span, lift towers, tower foundations, and a portion of the bridge seat. Once the old structures are removed, they will be replaced with a new transfer span, bridge seat, and lift cylinder shafts (see Appendix A of the IHA application).

To replace the aging transfer span, 40 timber piles and 16 steel piles (four 30-inch and four 24-inch wingwall steel piles, and eight temporary piles) will be removed using a vibratory hammer. The vibratory hammer will then be used to install up to 8 steel piles (five 30-inch and up to three 24-inch), up to 8 temporary steel piles, up to 8 piles for the new wingwall fender panels and reaction frames (up to four 24-inch and up to four 30-inch), and two 80-inch cylinder shafts that will house the hydraulic lifts. The use of an impact hammer will be limited to the

“proofing” of five 30-inch piles and three 24-inch piles in order to drive them the last two feet into the substrate. A breakdown of pile types and associated activity are shown in Table 1.

Table 1. Summary of total pile removal and installation activities

Activity	Number of Piles (maximum)	Total Time to Remove/Install	Days to Complete
Removal of timber piles	40	10 hrs.	2
Removal of steel wingwall piles	16	4 hrs.	4
Install steel piles	8 (5 30-inch and up to 3 24-inch)	2 hrs. 40 min.	3
Install temporary piles	8	2 hrs.	2
Install wingwall piles	8	2 hrs. 40 min.	3
Install cylinder shaft casing	2 (80-inch)	40 min.	2
Proofing of steel piles	8	1 hr. 20min.	2

Of the eight 24- and 30-inch steel piles, three 24-inch piles will be installed to support the platform for the new Hydraulic Power Unit (HPU) and five 30-inch piles would be installed for the new bridge seat. Up to eight temporary steel piles will be installed using a vibratory hammer to support a template for construction of the cylinder shafts. The vibratory hammer will then be used to install the two 80-inch hollow steel cylinder shafts. The final eight 24- and 30-inch steel piles will be installed using a vibratory hammer for the new wingwall reaction frames and wingwall fender panels at the terminus of the transfer span.

Although the exact duration of pile driving will vary depending on the installation procedures and geotechnical conditions, the applicant estimates that the 16 24-to 30-inch permanent piles will each require 20 minutes of vibratory installation. Five 30-inch piles and up to three 24-inch piles will each require 10 minutes of impact driving or “proofing” to verify capacity. The vibratory driving of eight temporary piles that support the template for the

hydraulic cylinder shafts will each require 15 minutes to install because it will not be necessary to drive these piles as deep as the permanent piles. The two 80-inch cylinder shaft casing will take approximately 20 minutes each to install using a vibratory hammer. All piles will be installed with an APE Model 400 (or equivalent) vibratory hammer; however, it will be necessary to proof the five 30-inch bridge seat piles and three 24-inch HPU support piles using an impact hammer. Proofing will require 10 minutes of impact pile driving for each of these eight piles to verify load-bearing capacity. Sound attenuation devices, such as a bubble curtain, will be used during impact hammering. The wingwall temporary piles and the 80-inch cylinder shafts will be driven solely with a vibratory hammer.

In addition to pile installation, a total of 56 piles will be removed using vibratory extraction or a crane. These consist of the 16 steel piles and 40 old timber piles. If a timber pile breaks below the mudline – something older timber piles are prone to do – pile stubs will be removed with a clamshell bucket, but noise associated with this activity is expected to be negligible. Once piles and fragments of piles are removed, they will be loaded onto a barge or container and disposed of at an approved offsite location. There could be barges in the water to support these pile removal activities; however, these will be concentrated in the direct vicinity of the ferry terminal. Because direct pull and clamshell pile removal, and use of barges do not release loud sounds into the environment, marine mammal harassment from these activities is not anticipated.

Region of Activity

The activity will occur at the Port Townsend ferry terminal located in northern Puget Sound inside Port Townsend Bay.

Dates and Duration of Activity

The Washington Department of Fish and Wildlife's recommended in-water work window for this area is July 16 through February 15. Timing restrictions such as this are used to avoid in-water work when ESA-listed salmonid species are most likely to be present. Proposed pile installation and removal activities are scheduled to occur between November 12, 2012, and February 15, 2013, in agreement with the state's recommendation. The on-site work will last approximately 16 weeks with actual pile removal and driving activities taking place approximately 25 percent of that time (approximately 4 weeks).

Sound Propagation

Detailed descriptions of sound propagation and sound sources were provided in the Federal Register notice (77 FR 39471, July 3, 2012). Significant sound sources during in-water construction activities associated with the project include vibratory pile removal and pile installation using both vibratory and impact pile driving.

Since 1997, NMFS has used generic sound exposure thresholds as guidelines to estimate when harassment may occur. Current practice regarding exposure of marine mammals to sound defines thresholds as follows: cetaceans and pinnipeds exposed to sound levels of 180 and 190 dB root mean square (rms; note that all underwater sound levels in this document are referenced to a pressure of 1 μ Pa) or above, respectively, are considered to have been taken by Level A (i.e., injurious) harassment, while behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 120 dB rms for continuous sound (such as will be produced by the WSF activities) and 160 dB rms for pulsed sound, but below injurious thresholds. For airborne sound, pinniped disturbance has been documented at 100 dB (unweighted) for pinnipeds in general, and at 90 dB (unweighted) for harbor seals (note that all airborne sound levels in this document are referenced to a pressure of 20 μ Pa).

Data from other Washington State Ferries projects were used for the noise analysis of vibratory removal of 12-inch timber piles as well as the vibratory removal and driving of 30-inch and 24-inch hollow steel piles (Laughlin, 2005; Laughlin, 2010; Laughlin, 2011). Due to the lack of information related to the vibratory driving of 80-inch hollow steel cylinder shafts, noise levels recorded for a project using similar equipment in Richmond, California were used to estimate sound levels (CalTrans, 2007). For impact pile driving, WSF relied on measurements for steel piles at other Puget Sound ferry terminal locations (Laughlin, 2005). Sound levels for impact and vibratory pile driving are shown in Table 2. Ambient underwater sound levels in the vicinity of Port Townsend were measured in April 2010 (Stockham et al., 2010). These data show that local background levels are below 120 dB (50th percentile between 100 and 104 dB), at least during April; therefore, the Level B harassment threshold for continuous sound sources (120 dB) was not adjusted for this location. WSF conducted a site specific vibratory test pile project in coordination with NMFS at the Port Townsend Ferry Terminal to determine the distances at which vibratory pile removal or driving attenuate down to the 120 dB threshold (i.e., the threshold level used to measure Level B harassment for continuous sounds). The site specific test allowed physical factors in Port Townsend Bay that can influence sound attenuation rates to be taken into account, such as absorption in seawater, absorption in the sub-bottom, scattering from inhomogeneities (lack of uniformity) in the water column and from surface and bottom roughness and water depth (bathymetry). During the test, two hollow steel piles, one 36-inch and one 30-inch, were driven and removed using a vibratory hammer. An array of hydrophones measured in-water noise during the test project. Vibratory driving of the 36-inch steel pile generated 159 to 177 dB rms at 10 m, and vibratory driving of the 30-inch steel pile generated

164 to 174 dB rms at 10 m. Vibratory removal of the 30-inch steel pile generated 171 dB rms at 10 m. Based on these results, the sound generated from vibratory installation and removal of 30-inch piles may take up to 4.2 miles (6.8 km) to attenuate to below 120 dB. Because of the project area's location in a semi-enclosed bay, sound transmission will be stopped by land masses much earlier in certain directions.

In-air sound from pile driving also has the potential to affect marine mammals (specifically, pinnipeds) that are hauled out or at the water's surface. As a result, WSF analyzed the potential for pinnipeds hauled out or swimming at the surface near the ferry terminal to be exposed to airborne SPLs that could result in Level B behavioral harassment. The distance to the 90 dB Level B threshold for airborne sound was estimated to be 81 m, which is less than the distance to the nearest known haul out site 3 km away (Kilisut Harbor spit). Although there are no pinniped haul-out sites near the project area, animals could be exposed when swimming at the surface with their heads above the water; however, the airborne sound harassment zone is smaller than and encompassed by the underwater sound harassment zones for both vibratory and impact pile driving.

Table 2. Distances to harassment thresholds (vibratory hammer).

Pile Type and Size	Hammer Type	Sound Levels (rms)			
		190 dB	180 dB	160 dB	120 dB
Timber (removal)	Vibratory	n/a	n/a	n/a	2.2 km (1.4 miles)
24-inch steel (removal)	Vibratory	n/a	n/a	n/a	4 km (2.4 miles)
24-inch steel (install)	Vibratory	n/a	n/a	n/a	6.3 km (3.9 miles)

30-inch steel (removal)	Vibratory	n/a	n/a	n/a	18.5 km (15.6 miles)
30-inch steel (install)	Vibratory	n/a	n/a	n/a	39.8 km (24.7 miles)
80-inch steel (install)	Vibratory	n/a	n/a	n/a	50 km (31 miles)

Table 3. Distances to harassment thresholds without mitigation (impact hammer)

Pile Type and Size	Hammer Type	Sound Levels (rms)		
		190 dB	180 dB	160 dB
30-inch steel	Impact	5 m	22 m	465 m

Comments and Responses

We published a notice of receipt of the Navy's application and proposed IHA in the Federal Register on July 3, 2012 (77 FR 39471). During the 30-day comment period, NMFS received a letter from the Marine Mammal Commission (Commission) and a letter from a member of the public. The letter from a member of the public did not contain substantive comments. The comments from the Commission, and our responses, are provided here. All measures proposed in the initial Federal Register notice are included within the authorization and NMFS has determined that they will effect the least practicable impact on the species or stocks and their habitats.

Comment 1: The Commission recommends that we require WSF to implement ramp-up procedures after 15 minutes if pile-driving or -removal activities were delayed or shut down

because of the presence of a marine mammal within or approaching the exclusion zone and observers did not see that marine mammal leave the zone.

Response: We disagree with this recommendation. The Commission cites several reasons why marine mammals may remain in the exclusion zone after shutdown and yet be undetected by observers during the 15 minute clearance period (e.g., perception and availability bias). While this is possible in theory, we find it extremely unlikely that an animal could remain undetected in such a small zone and under typical conditions in Port Townsend Bay. The exclusion zone has a 22 m radial distance, and typical observation conditions in Port Townsend Bay are excellent. We believe the possibility of a marine mammal remaining undetected in the exclusion zone, in relatively shallow water, for greater than 15 minutes is discountable. A requirement to implement ramp-up after every shutdown or delay less than 30 minutes in duration would be impracticable, resulting in significant construction delays and therefore extending the overall time required for the project, and thus the number of days during which disturbance of marine mammals could occur.

Comment 2: The Commission recommends that we require WSF to monitor before, during, and after all ramp-ups of vibratory and impact pile driving to gather the data needed to determine the effectiveness of this technique as a mitigation measure.

Response: We disagrees that WSF needs to monitor for marine mammals before, during, and after all ramp-ups. Protected species observers will be on-site and monitoring for marine mammals at least 30 minutes prior to, during, and after all impact driving (including during ramp-ups) and at least two full days per week during all vibratory pile driving. We believe that monitoring for all impact driving and at least two days per week of vibratory pile driving days

per week will allow for adequate data collection and interpretation of how marine mammals are behaving in response to pile driving, including during ramp-ups.

Comment 3: The Commission recommends that we require WSF to monitor the Level A and B harassment zones to detect the presence and characterize the behavior of marine mammals during all pile-driving and removal activities that use a vibratory or impact hammer.

Response: As stated in the proposed IHA, marine mammal monitoring will occur 30 minutes before, during, and 30 minutes after all impact pile driving activities. In addition, at least two NMFS-approved protected species observers will conduct behavioral monitoring out to 1,900 m during all vibratory pile driving for the first two weeks of activity to validate take estimates and evaluate the behavioral impacts pile driving has on marine mammals out to the Level B harassment isopleth. NMFS believes this is an adequate effort of monitoring because sounds from vibratory pile driving will not exceed the Level A harassment threshold and sounds from impact pile driving only exceed the Level A harassment threshold 22 m from the source.

Description of Marine Mammals in the Area of the Specified Activity

Due to Port Townsend's location on the boundary between two inland water regions, 11 marine mammal species may occur at some time of year in the vicinity of the ferry terminal: harbor porpoise, Dall's porpoise, Pacific white-sided dolphin, killer whale, gray whale, humpback whale, minke whale, Pacific harbor seal, California sea lion, northern elephant seal, and Steller sea lion. The Steller sea lion, Southern Resident killer whale, and humpback whale are the only marine mammals that may occur in the vicinity of the ferry terminal that are listed under the ESA; the Southern Resident killer whale and humpback whale are listed as endangered and the eastern distinct population segment (DPS) of Steller sea lion is listed as threatened. All marine mammal species are protected under the MMPA. The Federal Register notice (77 FR

39471, July 3, 2012) summarizes the population status and abundance of these species and provides detailed life history information.

Potential Effects of the Specified Activity on Marine Mammals

Impact and vibratory pile driving are the construction activities associated with the proposed action with the potential to take marine mammals. Elevated in-water sound levels from pile driving in the proposed project area may temporarily impact marine mammal behavior.

However, elevated in-air sound levels are not expected to affect marine mammals because the nearest pinniped haul-out is approximately 3 km away and the zone of harassment for airborne sound is encompassed within the zones of harassment for underwater sound. The Federal Register notice (77 FR 39471, July 3, 2012) provides a detailed description of marine mammal hearing and of the potential effects of these construction activities on marine mammals.

Anticipated Effects on Habitat

The proposed activities at the Port Townsend ferry terminal would not result in permanent impacts to habitats used directly by marine mammals, such as haul-out sites, but may have potential short-term impacts to food sources such as forage fish and salmonids. There are no rookeries or major haul-out sites within 3 km, foraging hotspots, or other bottom features of significant biological importance to marine mammals that may be present in the vicinity of the project area. Therefore, the main impact issue associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously in this document. The most likely impact to marine mammal habitat occurs from the effects of pile removal and installation on likely marine mammal prey (i.e., fish) near the ferry terminal and minor impacts to the immediate substrate during removal and installation of piles during the transfer span replacement project. In addition, removal of the 40 creosote-

treated wood piles from the marine environment will have long-term benefits due to improvements in water and sediment quality. The Federal Register notice (77 FR 39471, July 3, 2012) describes these potential impacts in greater detail.

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must, where applicable, set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (where relevant).

The applicant will implement the following mitigation measures to minimize adverse impacts to marine mammals:

Temporal Restrictions

The Washington Department of Fish and Wildlife recommends an in-water work window of July 16 through February 15, annually. This work window was designed to avoid in-water work when ESA-listed salmonids are most likely to be present, but may also be beneficial to marine mammals that prey on salmon. Actual construction activities will take place from November 12, 2012, through February 15, 2013, which ensures that these activities do not coincide with salmonid use of the action area. The daily construction work window for in-water work will begin no sooner than 30 minutes after sunrise and will end at sunset (or shortly after sunset) when visibility decreases to the point where effective marine mammal monitoring is no longer possible.

Use of Noise Attenuation During Pile Driving with Impact Hammer

To the extent possible, a vibratory hammer would be used to drive all piles. It is anticipated that an impact hammer will be necessary to “proof” five 30-inch hollow steel piles. During impact pile driving, a bubble curtain will be used as an attenuation device to reduce hydroacoustic sound levels and avoid the potential for injury. In the event that hydroacoustic monitoring during in-water construction activities involving impact pile driving indicates that the proper attenuation is not being achieved, the proposed harassment and exclusion zones (described next) will be modified to account for the reduced attenuation.

Establishment of an Exclusion Zone

During impact pile driving, WSF will establish a marine mammal exclusion zone of 22 m around each pile to avoid exposure to sounds at or above 180 dB. The 190 dB (pinniped) injury isopleth is contained within the 22 m exclusion zone. The exclusion zone will be monitored during all impact pile driving to ensure that no marine mammals enter the 22 m radius. The purpose of this area is to prevent Level A harassment (injury) of any marine mammal species. Typically, an exclusion zone for vibratory pile driving is unnecessary to prevent Level A harassment, as source levels would not exceed the Level A harassment threshold; however, in response to a recommendation from the Marine Mammal Commission, a 5 m exclusion zone will be established during vibratory pile driving of the two 80-inch piles.

Pile Driving Shut Down and Delay Procedures

Monitoring will be initiated 30 minutes prior to the commencement of pile driving activities. If a protected species observer sees a marine mammal within or approaching the exclusion zone prior to start of impact pile driving, the observer will notify the on-site construction manager (or other authorized individual), who will then be required to delay pile driving until the marine mammal has moved outside of the exclusion zone or if the animal has

not been resighted within 15 minutes. If a marine mammal is sighted within or on a path toward the exclusion zone during pile driving, pile driving will cease until that animal has cleared and is on a path away from the exclusion zone or 15 minutes has lapsed since the last sighting.

Soft-start Procedures

A “soft-start” technique will be used at the beginning of each day’s pile installation or removal, or if installation or removal has ceased for more than one hour, to allow any marine mammal that may be in the immediate area to leave before the pile hammer reaches full energy. For vibratory pile driving, the soft-start procedure requires contractors to initiate noise from the vibratory hammer for 15 seconds at 40-60 percent reduced energy followed by a 1-minute waiting period. The procedure will be repeated two additional times before full energy may be achieved. For impact hammering, contractors will be required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 1-minute waiting period, then two subsequent three-strike sets.

In-water pile driving weather delays

Should environmental conditions (e.g., fog, high sea state, poor lighting) obscure the harassment zone, pile driving will be suspended until visibility returns.

NMFS has carefully evaluated the applicant’s proposed mitigation measures and considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals; (2) the proven or likely efficacy of the specific measure to minimize adverse impacts

as planned; and (3) the practicability of the measure for applicant implementation, including consideration of personnel safety, and practicality of implementation.

Based on our evaluation of the applicant's proposed measures, NMFS has determined that the proposed mitigation measures provide the means of effecting the least practicable adverse impacts on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must, where applicable, set forth "requirements pertaining to the monitoring and reporting of such taking". The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for IHAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present.

WSF has developed a monitoring plan that includes monitoring the harassment and exclusion zones during pile driving and collecting sighting data for each marine mammal species observed during in-water construction activities. To implement this plan, qualified marine mammals observers will be on-site at all times during pile removal and installation. WSF must designate at least one biologically-trained, on-site individual, approved in advance by NMFS, to monitor the area for marine mammals 30 minutes before, during, and 20 minutes after all impact pile driving activities and call for shut down if any marine mammal is observed within or approaching the designated exclusion zone (preliminarily set at 22 m for impact pile driving and 5 m for vibratory installation of the 80-inch piles). In addition, at least two NMFS-approved protected species observers would conduct behavioral monitoring at least two days per week to

estimate take and evaluate the behavioral impacts pile driving has on marine mammals out to the Level B harassment isopleths. Note that for impact hammering, this distance is about 465 m. For vibratory hammering, this estimated distance is about 6.8 km. Protected species observers will be provided with the equipment necessary to effectively monitor for marine mammals (for example, high-quality binoculars, spotting scopes, compass, and range-finder) in order to determine if animals have entered into the exclusion zone or Level B harassment isopleth and to record species, behaviors, and responses to pile driving.

WSF will also conduct acoustic monitoring during vibratory pile installation of 24-inch and 80-inch steel piles. Acoustic monitoring during timber pile removal and installation and removal of 30-inch steel piles will not be conducted because data from these activities was collected in 2010 during the Port Townsend test pile driving project (Laughlin, 2010; Stockham *et al.*, 2010) and during a 2010 dolphin replacement project in Port Townsend.

Protected species observers will be required to submit a report to NMFS within 120 days of expiration of the IHA or completion of pile driving, whichever comes first. The report would include data from marine mammal sightings (such as species, group size, and behavior), any observed reactions to construction, distance to operating pile hammer, and construction activities occurring at time of sighting.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption

of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

All anticipated takes will be by Level B harassment, involving temporary, short-term modifications of behavior by small numbers of marine mammals within the action area. Marine mammals may also temporarily avoid the area during construction. The planned mitigation and monitoring measures are expected to avoid injurious or lethal takes such that take by Level A harassment, serious injury or mortality is considered remote.

If a marine mammal responds to an underwater sound by changing its behavior (e.g., through relatively minor changes in locomotion direction/speed or vocalization behavior), the response may or may not constitute taking at the individual level, and is typically unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals or on the stock or species could potentially be significant (Lusseau and Bejder, 2007; Weilgart, 2007).

Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate take based on how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound. Typically, potential takes are estimated by multiplying the ensonified area by the local marine mammal densities of the species that may occur within that zone. There are no density estimates for any Puget Sound population of marine mammals. As a result, for this IHA, takes were estimated using local marine mammal data sets (e.g., Orca Network, state and federal agencies), opinions from state and federal agencies, and incidental observations from WSF biologists. For example, between 1990 and 2005, an average of 1.75 killer whale groups were reported in the quadrant that includes Port Townsend, with most sightings occurring between

September and December, and March. On the basis of that information, an estimated amount of potential takes for killer whales is presented here. However, while a pod of killer whales could potentially visit again during the project timeframe, and thus be taken, it is more likely that they would not.

The project area is not believed to be particularly important habitat for marine mammals, although harbor seals are year-round residents and have a known haul-out sites within 3 km of Port Townsend (haul-out sites for other pinniped species are located at a distance of a 7 km or greater from the project site). Therefore, behavioral disturbances that could result from anthropogenic sound associated with the proposed activities are expected to affect only a relatively small number of individual marine mammals, although those effects could be recurring if the same individuals remain in the project vicinity.

WSF requested authorization for the potential taking of small numbers of Steller sea lions, California sea lions, harbor seals, northern elephant seals, killer whales, Dall's porpoises, harbor porpoises, Pacific white-sided dolphins, gray whales, humpback whales, and minke whales in Port Townsend Bay and Admiralty Inlet that may result from pile removal and installation during construction activities associated with the transfer span replacement project described previously in this document. Based on comments received from the Marine Mammal Commission, the takes requested for harbor seals, California sea lions, Steller sea lions, and harbor porpoise have been corrected to account for the number of days during which the activity will occur instead of the number of hours extrapolated to days. The corrected numbers are reflected in the following paragraphs. The takes requested are expected to have no more than a minor effect on individual animals and no effect at the population level for these species. Any effects experienced by individual marine mammals are anticipated to be limited to short-term

disturbance of normal behavior or temporary displacement of animals near the source of the sound.

Current NMFS practice regarding exposure of marine mammals to anthropogenic noise is that in order to avoid the potential for injury (PTS), cetaceans and pinnipeds should not be exposed to impulsive sounds of 180 and 190 dB or above, respectively. This level is considered precautionary as it is likely that more intense sounds would be required before injury would actually occur (Southall et al., 2007). Potential for behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 160 dB for impulse sounds (such as impact pile driving) and 120 dB for non-pulse noise (such as vibratory pile driving), but below the aforementioned thresholds. These levels are also considered precautionary.

Based on empirical measurements taken by WSDOT and Caltrans (which are presented in the Description of Specified Activities section above), estimated distances to NMFS' current harassment threshold sound levels from pile driving during the proposed construction activities are presented in Table 4. The 22 m distance to the Level A harassment threshold and the establishment of a 5 m exclusion zone for vibratory installation of the 80-inch piles provides protected species observers a reasonably sized area to monitor during impact pile driving. Monitoring these zones and implementing mitigation measures will prevent marine mammals from being exposed to sound levels that reach the Level A harassment threshold.

Table 4. Distances to NMFS' marine mammal harassment thresholds (without attenuation).

	Level A (190/180 dB)	Level B harassment (160 dB)	Level B harassment (120 dB)
Impact hammering	22 m	465 m	n/a
Vibratory hammering	5 m (80-inch piles only)	n/a	6.8 km

For each of the 11 marine mammal species that may occur within the proposed action area, incidental take was determined by estimating the likelihood of a marine mammal being present with the Zone of Influence (ZOI) during pile driving activities (Table 5). Typically, incidental take is estimated by multiplying the area of the ZOI by the local animal density. This provides an estimate of the number of animals that might occupy the ZOI at any time; however, there are no density estimates for marine mammal populations in Puget Sound. Therefore, the take requests were estimated using local marine mammal data sets (e.g., Orca Network, state and federal agencies), opinions from state and federal agencies, and incidental observations from WSF biologists. Expected marine mammal presence was determined by past observation and general abundance near the Port Townsend ferry terminal during the construction work window. Distances to the applicable NMFS thresholds for Level A and Level B harassment take for each type of pile (vibratory and impact) were presented in Section 1.6.6 in the IHA application. These distances were used to calculate the various ZOIs or area ensonified by sounds at or greater than threshold. For example, for the Level A threshold, the estimated distance to the 180 dB isopleth was 22 m for impact pile driving, which equates to a 1,520 square meter ZOI. The distance to the 160 dB isopleths during impact pile driving was estimated at 465 m, which equates to a 0.45 square km (only half the area is water). The distance to the 120 dB threshold for vibratory pile driving was estimated at 6.8 km, which equates to a ZOI of approximately 42 square km in water. Both of these areas will be monitored during construction to report actual marine mammal takes by Level B harassment.

Table 5. Population abundance estimates, total authorized take, and the percentage of the population or stock that may be exposed to sounds resulting in Level B harassment during the proposed ferry terminal replacement project.

Species	Abundance	Take Authorization	Percentage of Population or Stock
Gray Whale	20,000	2	0.01
Humpback Whale	1,100	2	0.18
Minke Whale	1,000	2	0.2
Killer Whale (Transient)	314	3	1
Killer Whale (Southern Resident)	86	27	31
Harbor Porpoise	10,682	306	2.8
Dall's Porpoise	57,000	9	0.02
Pacific White-sided Dolphin	25,233	10	0.04
Harbor Seal	14,612	180	1.2
California Sea Lion	238,000	108	0.04
Northern Elephant Seal	101,000	5	0.005
Steller Sea Lion (eastern DPS)	48,500	90	0.19

Airborne noises can affect pinnipeds, especially resting seals hauled out on rocks or sand spits. The airborne 90 dB Level B threshold for hauled out harbor seals was estimated at 81 m, and the airborne 100 dB Level B threshold for other pinnipeds was estimated at 17 m. No haulout sites are within the disturbance threshold distances; the nearest harbor seal haulout is approximately 3 km from the ferry terminal. In addition, the airborne noise harassment ZOI is smaller than both the impact and vibratory hammer underwater noise harassment ZOIs, and therefore is encompassed in the underwater noise take estimates.

Surveys conducted during the fall/winter of 2009/2010 by biologists contracted by the Snohomish Public Utility District recorded about 10 harbor seals per day (Tollit et al., 2010). The applicant estimates that the total number of pile driving and removal hours would not exceed 18 eight-hour work days; therefore, the estimated number of seals that could be harassed would be 180. The survey conducted by Tollit et al. (2010) also recorded sightings of California sea lions passing Admiralty Head (located directly across Admiralty Inlet from Port Townsend) and reported six animals over the course of 88 days between October 2009 and February 2010. Similarly, the Washington Department of Fish and Wildlife recorded eight California sea lions in Admiralty Inlet during vessel-based surveys in Puget Sound between 1992 and 2004. Based on the results from these surveys, WSF estimates that up to six California sea lions could enter the 160 dB harassment zone per day, or a total of 108 during the 18 eight-hour work days that would involve in-water pile installation and removal activities. These surveys did not, however, report any sightings of northern elephant seals in Admiralty Inlet. Wintering elephant seals haul out on Protection Island, which is 12 km to the west of Port Townsend, and Smith and Minor Islands 24 km to the north, but may forage as far south as Admiralty Inlet. Therefore, it is possible that elephant seals could enter Port Townsend Bay during the proposed activity at the ferry terminal, and WSF believes that a couple northern elephant seals could be exposed to sound from pile driving and removal activities each day, especially since they are capable of spending prolonged periods below the water where they cannot be detected. Based on these considerations, WSF requests a total of 5 northern elephant seal takes by Level B harassment during for the three eight-hour work days that involve pile driving and removal. Among pinnipeds, Steller sea lions are relatively common in Admiralty Inlet during the winter as they move between the Strait of Juan de Fuca and Puget Sound; hauling out at Craven Rock east of Marrowstone Island, or on

channel buoys. The survey conducted by Tollit et al. (2010) recorded nearly 800 Steller sea lions over 88 days, or about 9 Steller sea lions per day. Considering that pile driving activities are expected to take about 18 work days to complete, WSF estimates that 90 Steller sea lions could be exposed to sound resulting in Level B harassment.

Take estimates for cetaceans also relied on recent survey data because density estimates for the inland waters of Washington are not available. Harbor porpoises are frequently observed in Admiralty Inlet, Tollit et al. (2010) recorded over 1,500 harbor porpoises during 88 survey days between October 2009 and February 2010, or approximately 17 per day. WSF estimates that pile driving activities will take about 18 work days to complete; therefore, approximately 306 harbor porpoises may be exposed to sound levels resulting in Level B harassment during this period. The survey by Tollit et al. (2010) did not positively identify any Dall's porpoises, and their preference for deeper waters and spatial distribution in Puget Sound make it unlikely that Dall's porpoises transiting through Admiralty Inlet would regularly enter the shallow waters of Port Townsend Bay; however, it is possible for Dall's porpoises to approach close enough to the proposed pile-driving activity to be exposed to sound resulting in Level B harassment.

Therefore, based on an average winter group size of three animals (PSAMP data), WSF estimates that three Dall's porpoise may enter the Level B harassment zone three times during pile driving activities, and request a total of nine Dall's porpoise takes by Level B harassment.

The inland distribution of Pacific white-sided dolphins is largely limited to the Strait of Juan de Fuca and Haro Strait on the west side of the San Juan Islands. Because these dolphins appear confined to the deeper channels of the inland waters of Washington State, they may occur in Admiralty Inlet, but are unlikely to enter the shallower waters of Port Townsend Bay. In addition, these animals move to warmer waters in the fall and winter and may be entirely absent

from the area during the proposed ferry terminal replacement project. Without better evidence on the reports of Pacific white-sided dolphins sighted in Admiralty Inlet during the winter or on the likelihood of these dolphins occurring in the vicinity of the ferry terminal, WSF requests 10 takes of Pacific white-sided dolphins by Level B harassment, which is based on their average group size exposed to one day of pile driving activity. Similar to Pacific white-sided dolphins, killer whales are not expected to be present near Port Townsend during the proposed fall/winter activity period. Transient killer whale rarely occur in Puget Sound, and Southern Resident killer whales spend much of the winter in the vicinity of the Fraser River; however, based on the unpredictable nature of transient movements and past records of Southern Resident sightings, it is possible that a pod of killer whales could pass through Admiralty Inlet and be within the Level B harassment zone. For example, Tollit et al. (2010) did report three sightings of Southern Resident killer whales passing Admiralty Head in October 2009, and one group of transients passed by in December 2009 (neither group entered Port Townsend Bay). Therefore, WSF requests 30 killer whale takes by Level B harassment, which equates to one group of three transients plus the 27 animals that comprise J pod – the Southern Resident pod most likely to occur in Puget Sound during the proposed activity period.

The IHA application also request takes of three species of baleen whale – gray whale, humpback whale, and minke whale. Gray whales generally enter the inland waters of Washington from March through May and sightings during the fall and winter are infrequent. However, because gray whales that enter Puget Sound tend to localize around Admiralty Inlet and Possession Sound, the possibility of a gray whale occurring in the vicinity of Port Townsend Bay during the proposed pile driving activity cannot be discounted. Therefore, based on the average gray whale group size, WSF requests two gray whale takes by Level B harassment.

Humpback whales are also occasionally observed in Puget Sound, but most sightings occur during the summer months and nearly all recent winter and fall sightings have been confined to the vicinity of the San Juan Islands. Although humpback whales are not expected in the vicinity of Port Townsend Bay during the proposed action, the possibility of a sighting cannot be fully discounted. Based on the average group size, WSF requests two humpback whale takes by Level B harassment. Minke whales are also very rare in Puget Sound during the winter; however, of the few reported sightings in Puget Sound, most have occurred in the vicinity of Admiralty Inlet. Given the rarity of these animals in winter, WSF only anticipates that minke whales would make an occasional transit, if any, of Admiralty Inlet during the proposed activity with the remote possibility of one or two whales entering Port Townsend Bay. Therefore, based on these considerations, WSF requests two minke whale takes by Level B harassment.

To summarize, WSF requests, and NMFS authorizes, takes of 180 harbor seals, 108 California sea lions, 5 northern elephant seals, 90 Steller sea lions, 306 harbor porpoises, 9 Dall's porpoises, 10 Pacific white-sided dolphins, 3 transient killer whales, 27 Southern Resident killer whales, 2 gray whales, 2 humpback whales, and 2 minke whales. These numbers do not take the required mitigation measures into consideration, and are likely overestimates because they represent the maximum number of animals expected to occur within the Level B harassment isopleth. The actual number of animals that may be harassed is likely to be less.

Negligible Impact Determination

NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." In making a negligible impact determination, NMFS considers a number of factors which

include, but are not limited to, number of anticipated injuries or mortalities (none of which would be authorized here), number, nature, intensity, and duration of Level B harassment, and the context in which takes occur.

Marine mammals would not be exposed to activities or sound levels which would result in injury (PTS), serious injury, or mortality. Pile driving would occur in shallow coastal waters of Port Townsend Bay. The action area (waters around the ferry terminal) is not considered significant feeding or reproductive habitat for pinnipeds. The closest haul-out is 3 km away, which is outside the project area's largest harassment zone for airborne noise. Any marine mammals – most likely pinnipeds - approaching the action area would likely be traveling or opportunistically foraging.

Marine mammals may be temporarily impacted by pile driving noise. However, marine mammals are expected to avoid the area to some degree, thereby potentially reducing exposure and impacts. Pile driving activities are expected to occur for approximately 4 weeks. Although marine mammal prey species may be affected by pile driving activities, any impacts would be short in duration and limited to the immediate vicinity of the ferry terminal. NMFS expects that any fish that exhibit behavioral responses (i.e., avoidance) while in-water construction activities occur would resume normal behavior following the cessation of the activity. Furthermore, Puget Sound is a highly populated and industrialized area, so animals are likely tolerant or habituated to anthropogenic disturbance, including low level vibratory pile driving operations, and noise from other anthropogenic sources (such as vessels) may mask construction related sounds. There are no known areas within Port Townsend Bay where any of these species concentrate specifically for breeding or feeding. Based on all the information considered, there is no anticipated effect on annual rates of recruitment or survival of affected marine mammals.

Accordingly, the activity will have a negligible impact on the affected species or stocks of marine mammals.

Small Numbers Determination

The amount of take WSF requested for each species, and NMFS authorizes, is considered small (less than five percent) relative to the estimated populations or stocks of 14,612 Pacific harbor seals, 238,000 California sea lions, 101,000 northern elephant seals, 48,500 Steller sea lions, 10,632 harbor porpoises, 57,000 Dall's porpoises, 25,233 Pacific white-sided dolphins, 314 transient killer whales, 20,000 gray whales, 1,100 humpback whales, and 1,000 minke whales.

The request of up to 27 takes of Southern Resident killer whales by Level B harassment represents a larger percentage (31%) of the population; this number was estimated because Southern Resident killer whales travel in large groups. Although killer whales are unlikely to occur in the vicinity of the ferry terminal during pile driving, if they were to appear, it may be as a full group or pod, which necessitates the need for a larger number of takes requested.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, NMFS determines that the proposed pile removal and installation would result in the incidental take of small numbers of marine mammals, by Level B harassment only, and that the total taking would have a negligible impact on the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action.

Endangered Species Act (ESA)

The Southern Resident killer whale and humpback whale are listed as endangered under the ESA and the eastern distinct population segment (DPS) of Steller sea lion is currently listed as threatened, but NMFS has proposed delisting of the eastern DPS (77 FR 23209, April 18, 2012). These species may occur within the action area. NMFS' Office of Protected Resources initiated formal consultation on the issuance of an IHA under section 101(a)(5)(A) of the MMPA for the takes of Southern Resident killer whales, humpback whales, and the eastern DPS of Steller sea lions. This consultation is complete, with the determination in a Biological Opinion that the activity is not likely to jeopardize the continued existence of the eastern DPS of Steller sea lions, Southern Resident killer whales, and humpback whales. In addition, the activity will not destroy or adversely modify designated critical habitat for Southern Resident killer whales. National Environmental Policy Act (NEPA)

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), as implemented by the regulations published by the Council on Environmental Quality (40 CFR parts 1500-1508), and NOAA Administrative Order 216-6, NMFS prepared an Environmental Assessment (EA) to consider the direct, indirect, and cumulative effects to marine mammals and other applicable environmental resources resulting from issuance of a one-year IHA and the potential issuance of additional authorizations for incidental harassment for the ongoing project. NMFS has made a Finding of No Significant Impact (FONSI) and, therefore, it is not necessary to prepare an environmental impact statement for the issuance of an IHA to WSF for this activity.

As a result of these determinations, NMFS has issued an IHA to the WSF to incidentally take marine mammals during in-water construction activities associated with the Port Townsend

ferry terminal transfer span replacement project in Port Townsend, WA, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: November 9, 2012.

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